DOCKET FILE COPY ORIGINAL

[redacted]

ERICSSON

December 1, 2000

RECEIVED
DEC 1 2000
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Magalie Roman Salas
Office of the Secretary
Federal Communications Commission
445 12th Street, S.W.
Room TW-A325
Washington, D.C. 20554

Re: "FCC Interim Report on Spectrum Study of the 2500 – 2690 MHz Band: The Potential for Accommodating Third Generation Mobile Systems", **ET Docket No. 00-232**, and

"NTIA Interim Report on Federal Operation in the 1755 – 1850 MHz Band: The Potential for Accommodating Third Generation Mobile Systems"

Enclosed please find an original and three copies of Ericsson's views on the above-captioned Reports. If you should have any questions or need further information, please do not hesitate to contact me at (202) 824 – 0117.

Sincerely,

Tom Lindstrom
Director, Telecom Policies & Regulations
Ericsson Inc.

Enclosures:
1. Comments of Ericsson Inc.
2. A Possible Global Roaming Plan for IMT-2000: Region 2

Cc (w/enclosures):
Diane J. Cornell
Julius P. Knapp
Thomas J Sugrue

No. of Copies rec'd 0
List ABCDE

Certificate No. FM 11374EUS

Ericsson Inc.
Office of Public Affairs
1634 I Street, N.W., Suite 600
Washington, DC 20006

Telephone: (202) 783-2200
Fax: (202) 783-2206

RECEIVED
DEC 1 2000
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

NTIA Interim Report, November 15, 2000 Federal Operations in the 1755 – 1850 MHz Band - The Potential for Accommodating Third Generation Mobile Systems	)	
FCC Interim Report, November 15, 2000 Spectrum Study of the 2500 – 2690 MHz Band - The Potential for Accommodating Third Generation Mobile Systems	)	FCC ET Docket No. 00-232

Comments of Ericsson Inc.

Ericsson Inc. ("Ericsson") hereby submits comments simultaneously addressing the two above-captioned Interim Reports. One important aspect of the current US Third Generation (3G) spectrum process is that the various possible spectrum bands are treated together to explore the most favorable options for 3G spectrum in the United States.

Summary

A spectrum allocation plan for the United States and the Americas can be devised in the long term and short term that supports viable 3G business plans, increases global spectrum harmonization, facilitates roaming, provides economies of scale, mitigates equipment complexity, preserves competition and observes technology-neutrality. The Interim Reports released by the NTIA and the FCC includes proposals contributing to such a plan. An initial step is the allocation of bands comprising 1710 – 1770 MHz and

No. of Copies rec'd_____
List ABCDE

2110 – 2170 MHz that provides global roaming opportunities. Ericsson has developed a Global Roaming Plan as the basis for further discussions.

Introduction

On October 13, 2000, the President signed an Executive Memorandum that underscored the need for the United States to secure additional radio frequency spectrum to support the future needs of wireless multimedia applications, high-speed access and Internet capability. It was noted that further delay in providing spectrum for Third Generation services in the United States increases the likelihood that US industry loses market share in these technologies and applications for the 21st century.

In his Memorandum, the President encouraged the cooperation between the Executive agencies and federal independent agencies and the adoption of some guiding principles: treating incumbent users equitably, taking national security and public safety into account, maintaining neutrality in regards to technology, encouraging competition, and harmonizing spectrum allocations regionally and internationally as far as practicable. The FCC in coordination with the National Telecommunications and Information Administration were asked to identify spectrum suitable for 3G by July 2001.

The third generation (3G) services and the systems that will provide these capabilities are intended to support consumers' demand for "anywhere, anytime communications". It is envisioned that these services and systems need to exhibit a high degree of commonality and compatibility with each other to support seamless global roaming and ubiquitous global services.

The following comments by Ericsson are based on a comprehensive 3G Global Roaming Plan, suggested by the company, showing how spectrum management can achieve benefits and maximum international harmonization both in the short-term and in a longer perspective. The Ericsson Global Roaming Plan for ITU Region 2 is attached.

I. Identifying harmonized global spectrum is of high importance

To support seamless roaming, while stimulating economies of scale through commonality, Ericsson believes it is important to identify 3G spectrum, which is harmonized globally to the greatest extent possible. This will stimulate the global market development of 3G services and systems, by reducing the cost for consumers in the United States and elsewhere, and by gaining market acceptance on a Regional and Global basis.

II. Globalization of markets

Not only is the communication market in transformation, there is a continued emergence of global operators and alliances that currently must support various technologies deployed in multiple frequency bands, globally. This emergence requires manufacturers to increasingly focus on providing solutions for the global market.

III. Spectrum below 3GHz should be selected

In the consideration of suitable spectrum, the propagation characteristics of radio waves in the frequency range below 3 GHz makes such spectrum most suitable for terrestrial mobile services since these frequencies can be efficiently transmitted and received in a mobile environment by small user terminals.

IV. Of highest priority to facilitate global roaming is an initial phase pairing 1710-1770 MHz with 2110-2170 MHz. This approach will satisfy short-term spectrum needs while preserving long-term harmonization opportunities.

Based on the timeframes involved to conduct extensive studies and to transition incumbent users, and the immediate need to identify spectrum in the United States to maintain its global competitiveness, Ericsson proposes, as a "3G Initial Phase" with the highest priority, the allocation of the band 1710 - 1770 MHz paired with 2110 - 2170 MHz for 3G systems. This arrangement would locate mobile transmitters (up-link) in the 1710-1770 MHz band and base station transmitters (down-link) in the 2110 - 2170 MHz band.

V. The initial phase offers an opportunity for Regional harmonization

Since this frequency pairing can be implemented in most countries in the Americas many of them support this "3G Initial Phase" pairing as an attempt to promote long-term harmonization within Region 2. It also offers an immediate opportunity to develop a spectrum plan for 3G systems that is in accordance with international allocations although second generation systems are implemented in the original ITU-R RR S5.388 IMT-2000 band (WRC-92).

VI. Global roaming and economies of scale are supported

In addition, this "3G Initial Phase" band pairing provides for economies of scale through equipment commonality by facilitating global roaming in all three ITU Regions by using the band 2110 - 2170 MHz as a common down-link. Corresponding up-links would be 1710 - 1770 MHz for Region 2 and 1920-1980 MHz for Regions 1 and 3. The resulting duplex distances mitigate equipment complexity.

VII. Technology neutrality and support of competition

The Global Roaming Plan does not promote or prohibit the selection of technology. It supports a step-by-step approach that will allow existing second generation systems to continue operating, as needed, in their current 1.9 GHz band. It accommodates the spectrum needs of new operators, as well as existing operators, and will allow the co-existence between 3G systems and current services.

VIII. Additional steps to address longer-term spectrum needs

Similar to the Plan developed by the Secretary of Commerce in response to the Executive Memorandum, the Global Roaming Plan is a phased approach considering 3G spectrum needs at different points in time. Spectrum will need to be made available for 3G services in several phases corresponding to market developments and system deployment and migration.

The "3G initial Phase" does not satisfy the longer-term spectrum demand predicted for 3G services, e.g. as forecasted by ITU-R. Therefore, additional spectrum directly above 1770 MHz for up-link and directly above 2170 MHz for down-link should be considered.

Furthermore, all or portions of the band 2500-2690 MHz, depending on market demands, should also be considered as down-link for new 3G entrants and to provide additional capacity for PCS 1900 system and 3G Initial Phase operators.

The Global Roaming Plan finally envisions eventual global conversion of 2G spectrum to 3G use, thereby finalizing the global harmonization process.

IX. A phase beyond current WRC spectrum

Based on existing market forecasts which predict an increasing number of subscribers and substantial increases in the amount of traffic, consideration should be

given to the future identification of further spectrum, possibly the band 2700 – 2900 MHz as identified by the WRC-2000 for future study.

X. Availability of spectrum for the "3G Initial Phase" up-link

Spectrum needed for the "3G Initial Phase" up-link is consistent with one proposed option for 3G accommodation presented in the NTIA Interim Report.

The 1710-1755 MHz portion of the "3G Initial Phase" is in the process of becoming available for mixed commercial use. It is of key importance for the "3G Initial Phase".

The band 1755 – 1770 MHz should be made available in conjunction with the band 1710 – 1755 MHz in order to provide sufficient spectrum for the number of licenses needed to ensure competition. The spectrum requirement for each terrestrial IMT-2000 network operator is in the order of 15 MHz to support a sound business case for a public mass-market service. Such a business case would offer to the end-users the necessary capacity and quality to support a wide range of multimedia applications, including seamless service across geographical boundaries, when the Global Roaming Plan is in place.

Since interference to satellite control up-links may be the limiting factor in sharing this band, further analysis is required to determine if the predicted degradation of the link margin is as calculated, or if sharing is feasible.

If sharing is feasible, with a combination of geographical and time separation, protected area sites should be identified using a more detailed analysis of each site including terrain data or by field strength measurements. Additional consideration should

also be given to combining relocation from densely populated sites with sharing in more remote locations.

If sharing is considered unfeasible, attention should be focused on a transition schedule to permit clearing of this portion of the band with particular concentration on the SGLS channels 1-3 and ACT in the band 1768 – 1770 MHz. It is assumed that conventional fixed links will be relocated to alternate frequency bands by some reimbursement process and that further, various other Federal operations would need to relocate to other bands or re-tune to other bands.

XI. Availability of spectrum for the "3G Initial Phase" down-link

Spectrum needed for the "3G Initial Phase" down-link (2110 – 2170 MHz) is included among the spectrum bands to be considered in the Final Reports and the FCC final spectrum allocation.

However, to implement the 3G Initial Phase with viable spectrum availability for each operator and preserved competition, the frequency bands 2150 – 2160 MHz and 2165 – 2170 must also be addressed by the FCC in its process to consider whether transition to or sharing with 3G systems is feasible. If sharing is considered unfeasible, attention should be focused on a transition schedule to permit clearing of these portions of the band 2110 – 2170 MHz using a reimbursement process in the timeframe suitable for the 3G Initial Phase.

XII. Availability of spectrum for subsequent phases of the Global Roaming Plan

Additional up-link spectrum directly above 1770 MHz is consistent with one proposed option for 3G accommodation presented in the NTIA Interim Report.

Spectrum needed for additional down-link capacity is consistent with all the options for accommodating 3G systems in the 2500-2690 MHz band described in the FCC Interim Report. Using the band as a down-link only would create a more flexible sharing scenario than the in-band pairing arrangement envisaged in the FCC report.

The lack of uniformity in the licensing and use of ITFS and MDS spectrum and their use in the most populated areas of the country presents a number of challenges to developing a band-sharing plan between 3G systems and incumbent ITFS and MDS systems. Therefore, an initial band segmentation plan in which 3G and ITFS/MDS spectrum is concentrated in separate contiguous blocks is preferable. This option, using the band or portions of the band 2500 – 2690 MHz as down-link spectrum, can be complements to the 3G Initial Phase and the PCS 1900 bands to provide immediate relief to capacity constrained systems and allows for easier sharing conditions with other existing systems.

In addition, new 3G entrants can be added by pairing spectrum in the 1.8 GHz band with spectrum in the 2.5GHz band and asymmetrical pairing can be facilitated.

As indicated in the Interim Report, this option, which allocates contiguous bands to each service, minimizes the impact to incumbent systems. As further indicated in the Interim Report, improving the spectrum efficiency of the incumbent systems should be explored as a means to compensate a reduction in spectrum for ITFS.

XIII. FCC – NTIA cooperation necessary

Close cooperation is required between the NTIA and the FCC, with spectrum harmonization and global roaming as key criteria, to avoid more fragmentation when the frequency bands identified for IMT-2000 are selected and allocated. As illustrated by the

proposed Global Roaming Plan, all spectrum bands identified as suitable for 3G systems must be considered together.

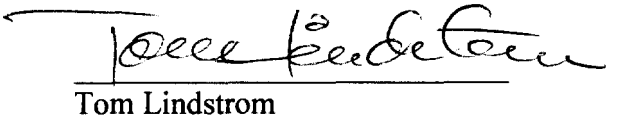
XIV. In summary – a way forward

The Global Roaming Plan presents a phased approach that facilitates a progression from the existing fragmented global situation to greater harmonization. Such a phased approach should be developed and would include the consideration of existing and planned systems and their possible evolution to IMT.

Foremost in the implementation of the Global Roaming Plan is the "3G Initial Phase", which makes available the bands 1710 – 1770 MHz paired with 2110 – 2170 MHz for immediate use, thereby allowing the US market players to increase their competitiveness in the global wireless market.

Respectfully submitted,

Ericsson Inc.



Tom Lindstrom
Director, Telecom Policies & Regulations

1634 I Street, N.W.
Washington DC 20006
(202) 783-2200

December 1, 2000

[redacted]

SOURCE: ERICSSON

RECEIVED
DEC 1 2000
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

A POSSIBLE GLOBAL ROAMING PLAN FOR IMT-2000: REGION 2[1]

Introduction

In order to facilitate the timely deployment of third generation (3G) global communication systems and at the same time afford the capability for Administrations to develop National mobile systems transition and implementation plans, the frequency arrangements in the spectrum identified by WARC-1992, WRC-2000 and possibly at future WRC's for IMT-2000 should accordingly offer as much flexibility as possible.

In this contribution an investigation of market trends, a possible frequency arrangement and the existing spectrum "situation" are explored in relationship to a global roaming plan for IMT-2000. The Global Roaming Plan (GRP) considers a possible usage of the bands or portions of the bands 1710 – 2025 MHz as uplink and 2110 – 2200 MHz and 2500 – 2690 MHz as downlink. This possible frequency arrangement, including usage of future spectrum, will satisfy the long-term requirements of regulators, operators, vendors and end users alike.

Market Trends

The communications industry is on the verge of a fundamental transformation. The Mobile Internet and broadband multiservice networks will be global mass-market phenomena. It has become a dominant model for all further mainstream development of communications. This transformation will come as a result of a number of communication megatrends:

- The phenomenal growth of mobile telephony and its expansion from symmetric voice services to the Mobile Internet with increasingly asymmetric multimedia content.
- The Mobile Internet will bring the Internet into the pocket of the user and create a new world of personalized, info-centric, always-on and always-with-you services.
- The extraordinary growth of the Internet services and applications.
- The large volumes of new mobile telephones and devices shipped every year – more than 500 million in 2001 – and wireless enabled communicating PCs, cars and appliances; bringing ever more powerful communicating devices in the hands and the homes of the users.
- The compelling case for e-business.

[1] Region 1: Africa, Europe and Middle East (CEPT, Arab States & African Group); Region 2: Americas (CITEL); Region 3: Asia and Pacific (APT)

- New technologies and standards enabling affordable broadband access and multiservice networking.
- Network convergence, moving from vertically integrated "single"–service networks to open, horizontally layered, multiservice networks.
- Intensified competition and specialization driven by deregulation and globalization.

Not only is the communication market in transformation, there is a continued emergence of global operators and alliances that currently must support various technologies deployed in multiple frequency bands, globally. This emergence leads manufacturers to increasingly focus on providing solutions for the global market. Therefore, long-term spectrum management is needed to avoid further fragmentation of the frequency bands identified for IMT-2000, now and in the future. Spectrum management is a key facilitator in this emerging market globalization and should not be replaced with reliance on technical solutions[2] as a substitute for spectrum planning.

The Global Roaming Spectrum Arrangement

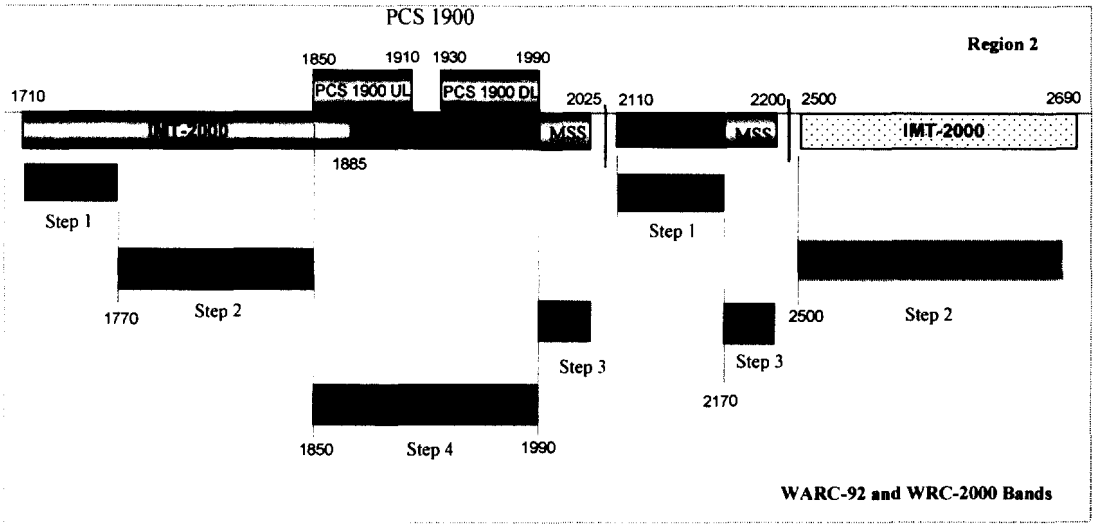
One of the frequency arrangement options identified in Temp-Doc 53 of ITU-R WP8F suggests a band plan using the band 1710 – 2025 MHz as uplink and the bands 2110 – 2200 MHz and 2500 – 2690 MHz as downlink. This frequency arrangement is consistent with the agreed high-level objectives established by WP8F in document 8F/19 for the IMT-2000 spectrum vision and could be an alternative for consideration by Administrations. In addition:

- Such an approach can accommodate the spectrum needs of new operators, as well as existing operators, and will allow the co-existence between 3G systems and current services.
- This frequency arrangement neither limits nor favors the deployment of certain IMT-2000 technologies.
- This arrangement facilitates a step-by-step approach that will allow existing second-generation systems to continue operating, as needed, in their current bands.

Figure1 illustrates how the spectrum identified at WARC-92 and WRC-2000 can be arranged and used in a phased approach to support the large volumes of future mobile devices in a capacity constrained market and to support new services.

---

[2] As a result of discussions within the CPM-2000 and in accordance with section 1.1.1.1 of the CPM text, "equipment manufacturers recommend that administrations should not rely on future, possibly costly, technological advancements (e.g. multimode, multiband reconfigurable or fully digitized "software" radios, and adaptive antennas) to provide sufficient spectrum management flexibility and address the difficulties caused by band fragmentation, in order to offer global services without global spectrum. Manufacturers also considered that to do so may lead to unnecessary delay in implementing global services and result in roaming complications for customers, manufacturers and operators."



Step 1: 1710-1770 MHz as UL and 2110-2170 MHz as DL
Step 2: 1770-1850 MHz as UL and 2500-2690 MHZ as DL
Step 3: 1990-2025 MHz as UL and 2170-2200 MHz as DL
Step 4: 1850-1990 MHz as UL

Figure 1. Global Roaming Plan

Step 1. Global Roaming

In the initial phase or step, the pairing of band 1710-1770 MHz as the mobile station (MS) transmit (uplink) with the band 2110-2170 MHz as the base station (BS) transmit or downlink offers an immediate opportunity for new 3G entrants, services and global roaming. In this case,

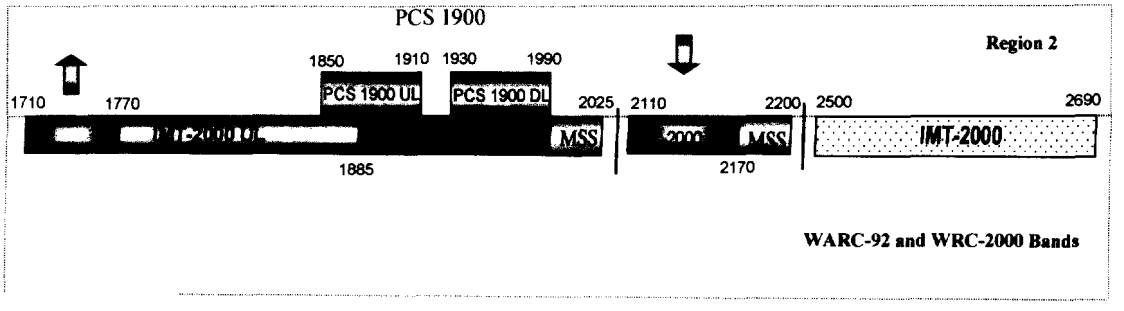


Figure 2. "Initial Phase"

the band 2110 - 2170 MHz would serve as a downlink in all three Regions of the world. Therefore, a terminal with global roaming capability could be immediately realized. When operating in Region 2, a dual mode terminal would operate, for example, in either PCS 1900 or IMT "Initial Phase" mode. When operating in some countries of Region 1&3, the terminal would operate using the Initial Phase mode. These bands need to be available at the same time. The MDS return channel in the band 2150 – 2160 MHz is discussed in section *"Existing" situation* (reference page 9).

Step 2. Capacity and New Entrants

The following scenarios consider the bands 1770 – 1850 MHz as additional uplink for new 3G entrants or to increase the capacity of Initial Phase operators. In addition, the band 2500 – 2690 MHz is also considered as downlink for the new 3G entrants or additional downlink capacity for PCS 1900 systems and existing Initial Phase operators. These bands are subject to National availability.

- **2G FDD:** The existing PCS 1900 operators may offer its customers a capacity boost by offering multimode terminals which can operate dynamically, both in PCS and IMT-2000 (reference Figure 3).
  - PCS uplink and PCS downlink, e.g. voice communication
  - PCS uplink and IMT-2000 downlink in the band 2500 - 2690 MHz, e.g. asymmetric down loading of extensive file or image reception.

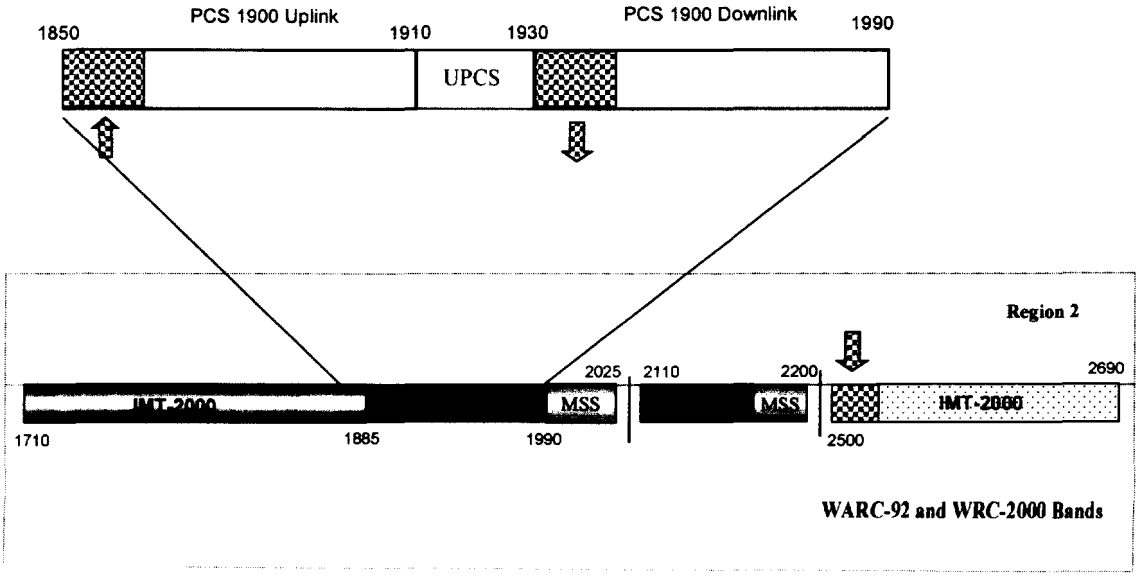


Figure 3. Add Capacity in 2.5 GHz for PCS 1900

- **3G FDD:** By making available spectrum in the 1770 – 1850 MHz and 2500 – 2690 MHz, based on market demand and National requirements, existing Initial Phase operators can increase their capacity in both the uplink and downlink. In addition, spectrum for new 3G operators can be provided. For example, a new entrant can be added using a portion of the spectrum in the band 1770 – 1850 MHz paired with 2500 – 2690 MHz. Furthermore, Initial Phase operators can increase their capacity in the uplink using spectrum in the 1770 – 1850 MHz and/or increase its downlink capacity to support asymmetric downloading of data by using the band 2500 - 2690 MHz. Reference Figure 4.

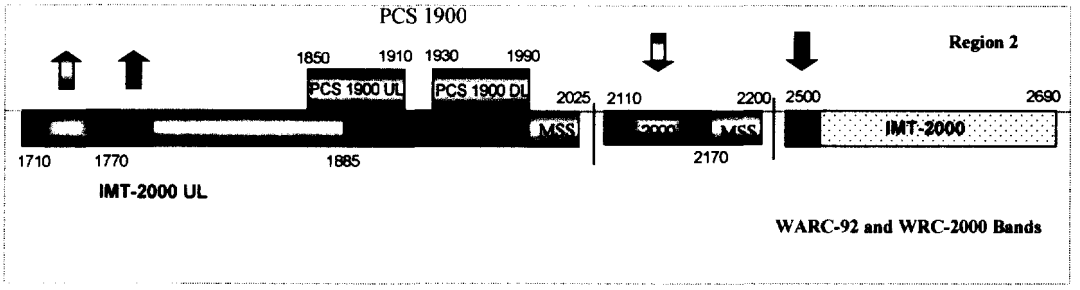


Figure 4. Add Capacity or New Entrants

Therefore, not only can 2500 – 2690 MHz, as downlink spectrum, provide immediate relief to capacity constrained systems, its usage as downlink-only spectrum would also allow for easier sharing conditions with other incumbent spectrum users. If the spectrum allocations in this band use different blocks, the band as downlink only spectrum could facilitate sharing with possible existing in-band and out-of-band usage. This flexibility could permit its adaptation to individual national requirements. For instance in some countries the whole band may not be available, and accordingly the implementation would be easier when considering that only base stations in a downlink arrangement may be implemented in blocks between the existing usage. Whereas, a sharing situation with moving and transmitting user terminals is more difficult to manage.

In summary, the use of the bands 1770 – 1850 MHz and 2500 – 2690 MHz would provide for:

- the expected need for extra capacity for PCS and IMT-2000 systems,
- allow for easier sharing conditions with other existing and/or planned systems, and
- support the expansion from symmetric voice related services to the Mobile Internet with increasingly asymmetric multimedia content.

Step 3. Consider MSS Allocations

Based on market demand, the bands 1990 – 2025 MHz could be considered for 3G terrestrial services as uplink. Moreover, the band 2170 – 2200 MHz could also be considered as additional terrestrial downlink. These additional frequency bands could be used to supplement the existing 3G operator spectrum shortages expected in the longer-term or allow for additional operators to increase competition. As shown in the following figure, additional operators, can be added using 1990 – 2025 MHz as uplink paired with the band 2170 – 2200 MHz, as downlink spectrum.

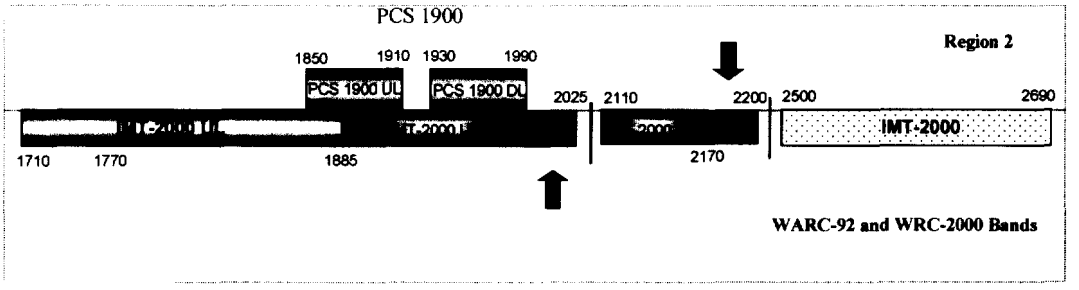


Figure 5. New Entrants

A reason for considering more spectrum for the terrestrial component of IMT-2000 is that the general MSS business opportunity has proven to be somewhat uncertain; accordingly, more terrestrial spectrum will be needed to support the overall need for capacity and new entrants.

Step 4. OPTIONAL Transition of PCS 1900 to 3G

Since 2G systems are severely constrained in their ability to fully support envisioned 3G services and will eventually be reduced on the market, existing PCS 1900 operators, may consider transitioning channels from the downlink band 1930 – 1990 MHz to new downlink channels in the band 2500 – 2690 MHz. This will facilitate new 3G services and minimize the number of bands required in a terminal to satisfy the need for global roaming. However, operators may continue to offer some of their users the ability to access 2G services using multi-band terminals in the 800 MHz cellular and 1900 MHz PCS bands for a long period of time to come.

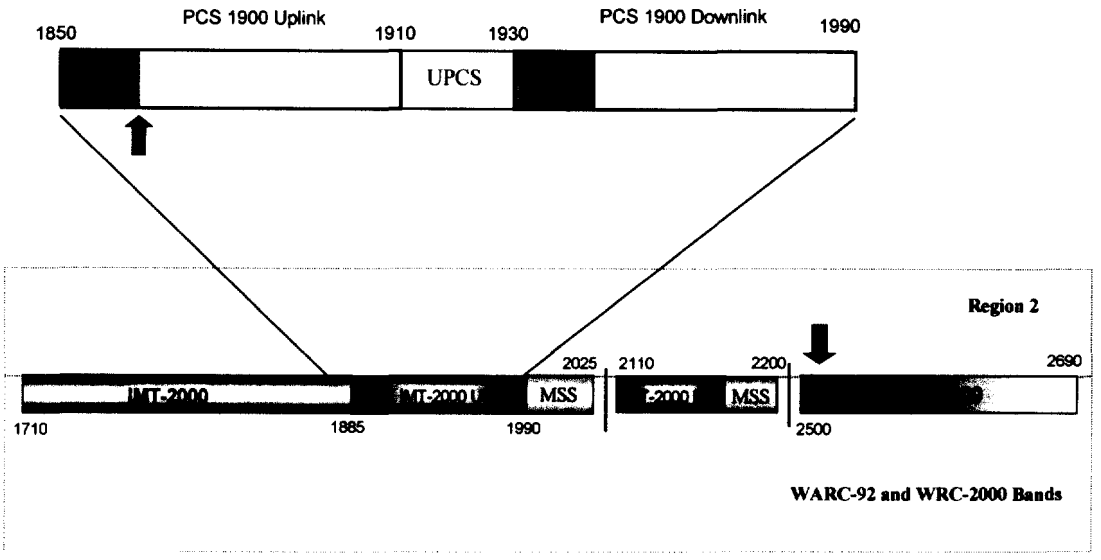


Figure 6. PCS 1900 Transition Arrangement

Figure 6 and the following steps illustrates the general transition technique for PCS 1900 noting that the spectrum which is made available or cleared in the PCS 1900 downlink during the transition can be used for new entrants (see Figure 7). The transition plan is as follows,

- First, to reduce the complexity of cross-border coordination and coordination with other operators in the band 1930 - 1990 MHz, it is recommended to those operators wishing to transition *fully* to 3G to temporarily close down all the downlink operations in this downlink band, but keep the uplink band 1850 - 1910 MHz (reference Figure 6).

- The next step will be to pair spectrum from the uplink band (1850 – 1910 MHz) with a corresponding portion of spectrum from the band 2500 - 2690 MHz. Thereby converting the band 1850 – 1910 MHz into 3G Base Station receive.

- Then in the band 1850 – 1910 MHz, turn off the PCS 1900 Base Station (BS) receivers and convert the equipment into 3G Base Station receive channels.

The operators can now offer *full* 3G operations using one or several channels in the band 1850 - 1910 MHz paired with channels in the band 2500 - 2690 MHz. In parallel and if required, 2G uplink in the band 1850 - 1910 MHz paired with 3G downlink in the band 2500 - 2690 MHz can be supported. Finally, when the remaining 2G operation in the downlink spectrum (1930 – 1990 MHz) ceases it can be transitioned to 3G operation as uplink consistent with the GRP. In this case, as shown in Figure 7, a new entrant can be

added in the 1930 – 1990 MHz paired with the band 2500 – 2690 MHz. When the PCS band has been transitioned, the Unlicensed PCS band 1910 – 1930 MHz can be considered for additional uplink spectrum in the longer term since some of these UPCS services will be delivered using 3G systems. Therefore, further analysis is required to determine under what conditions 3G systems can share this spectrum with possible consideration of existing UPCS systems in an indoor configuration.

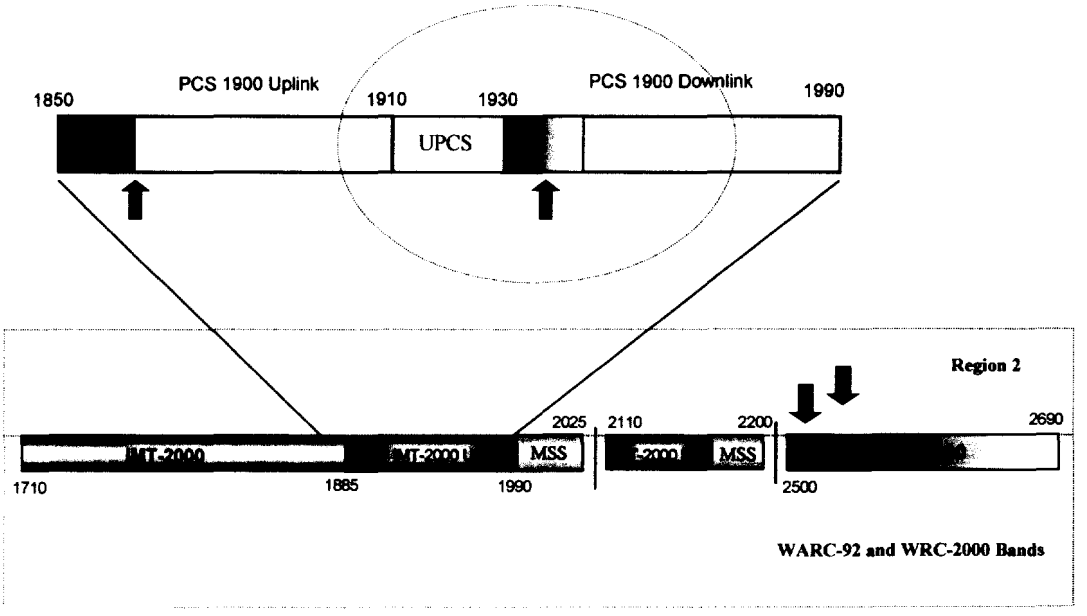


Figure 7. New Entrants after Transition

"Existing" Situation

However, there are differences in the deployment of existing systems using all or portions of bands within the frequency range of 1710 - 2690 MHz which may delay the availability of certain portions of the bands. The following is a general overview of the "existing" situation in some parts of Region 2:

- FCC's November 1999 Spectrum Policy Statement announced that spectrum in the 1710 - 1755 MHz, 2110 - 2150 MHz and 2160 - 2165 MHz bands may be proposed for allocation for advanced mobile and fixed communications services,

such as 3G[3]. The band 1710 - 1755 MHz is considered suitable as uplink and the 2110 – 2150/2160-2165 MHz is specified for downlink.

  - The 1710-1755 MHz band will be transferred to the FCC in year 2004 on a mixed use basis pursuant to the requirement of the Omnibus Budget Reconciliation Act of 1993 allowing Federal operations to remain in 17 protected areas.

- The 1755-1850 MHz band is under the jurisdiction of NTIA and is allocated in the US on an exclusive basis to the Federal Government for fixed and mobile services including tracking, telemetry, conventional fixed microwave systems, military tactical radio relays, air combat training systems, precision guided munitions, high resolution airborne video data links, and land mobile video functions such as robotics, surveillance, etc.

- The PCS band 1850 - 1910 MHz paired with the band 1930 - 1990 MHz is currently licensed for mobile service (PCS 1900). Based on license expiration dates and the market focus on the Initial Phase deployment of 3G services, the availability of this band is considered longer term in Region 2. However, this band is considered suitable for uplink (MS transmit) in the Global Roaming Plan (GRP).

- The band 1910 – 1930 MHz is currently designated as unlicensed and unpaired spectrum. Based on current market demand, the availability of the spectrum, consistent with the Grand Roaming Plan (GRP), is considered longer term for a possible uplink band. Further analysis is required to determine under what conditions 3G systems can share this as uplink spectrum with possible consideration of existing UPCS systems in an indoor configuration.

- The band 1990 – 2025 MHz paired with 2170 – 2200 MHz is currently designated for Mobile Satellite Services (MSS) and could be made available (in the longer term), based on market demand, consistent with the GRP. The band 1990-2025 MHz would be designated uplink and the 2170 – 2200 MHz is specified for downlink.

- The band 2150 – 2160 MHz is currently designated for MDS[4] and should be considered for transition to the band 3.5 GHz to allow the immediate introduction of the Initial Phase 1710 – 1770 MHz paired with 2110 – 2170 MHz.

---

[3] *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium: Policy Statement*, FCC 99-354, released November 22, 1999.

[4] Multipoint Distribution Service or "MDS" utilizes two 6 megahertz channels (Channel Nos. 1 and 2) in the 2150-2162 MHz band (in parts of the country, the 6 megahertz No.2 channel is replaced by a 4 megahertz No. 2-A channel (2156-2160 MHz)).

- The 2500 – 2690 MHz band was identified at the WRC-2000 for IMT-2000 systems in the year timeframe 2005-2010. The predominant use of the 2500-2690 MHz band is by the Fixed Service for Multipoint Distribution Service (MDS), Multichannel Multipoint Distribution Service (MMDS), and Instructional Television Fixed Service (ITFS). Based on incumbent usage, the band may not be globally available and will not be available at the same time in different Regions and countries. This band is considered suitable for downlink in the Global Roaming Plan.

- Based on existing predictions for future mobile terrestrial spectrum, consideration should be given to possible sharing conditions between 3G and existing incumbent systems in the band 2700 – 2900 MHz as downlink spectrum to support extra capacity needs.

Global Roaming Implementation

One of the major goals of IMT-2000 (the third generation global communication system) is the possibility to offer global roaming of all multimedia and other advanced services. Therefore, a key element is the ability for the terminal equipment to support not only Region 2 spectrum but in addition the Region 1 and 3 spectrum arrangement in accordance with ITU-R RR S5.388. Accordingly, a global end-user terminal from Region 2 would switch to using 1920 – 1980 MHz as uplink while roaming in some countries of Region 1 and 3. However, the downlink spectrum 2110 – 2170 MHz would remain consistent across all three Regions.

It is recognized that variable duplex separation technology is not yet commercially available. Therefore, transitional steps must be considered in order to facilitate the development and production of terminal stations that are cost-effective and that simplify the arrangement of duplex frequencies in the very short term. The following diagram illustrates a possible phased approach for discussion of the bands supported on a year by year basis.

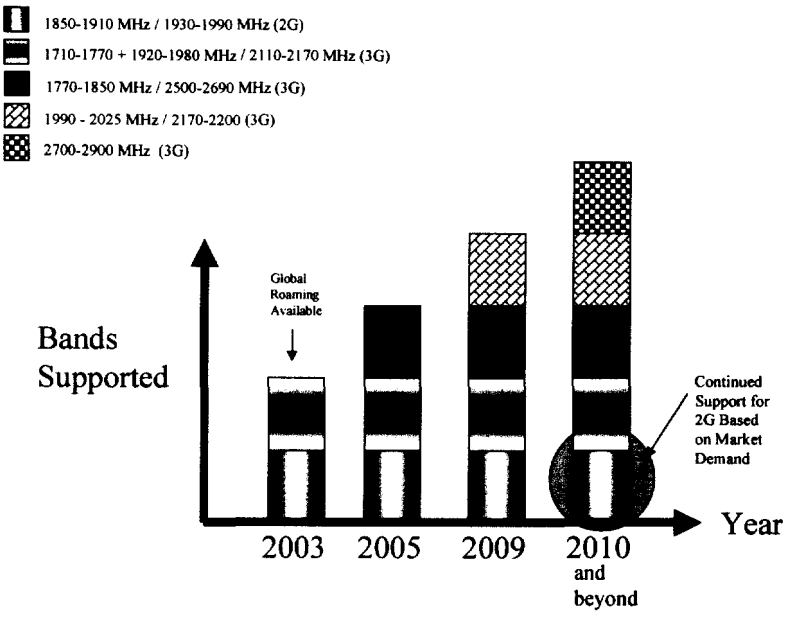


Figure 8. Tentative Terminal Evolution

As a basis, support for the Initial Phase for Region 2 and IMT-2000 Core bands for Regions 1 and 3, and PCS 1900 would be available in year 2003 and would offer an opportunity both for global roaming and to those administrations that have chosen to implement second generation systems in the original IMT-2000 band to develop a national plan that is in accordance with international allocations. As market demand dictates and spectrum is made available, the 3G uplink spectrum would be expanded from 1710-1770 MHz to eventually 1770-1850 MHz possibly starting in the year 2005. The downlink spectrum would also respectively increase from 2110-2170 MHz to 2170-2200 MHz, 2500-2690 MHz and perhaps 2700-2900 MHz by the year 2010 and beyond. Optionally, as PCS 1900 transitional plans begin implementation, the 2G PCS 1900 mode could be phased-out except possibly in those developing countries that will require support for a number of years to come.

As an additional consideration, the spectrum requirement for terrestrial IMT-2000 networks should be on the order of 2 x 15 MHz per network to support a business case for public mass-market services. This amount of spectrum has been recommended by some regional and international fora to be the minimum and has been reflected in the majority of the current assignments of 3G licenses in Region 1 and 3 countries. Such a business case would offer to the end-users the necessary capacity and quality to support a wide range of multimedia applications including seamless service across geographical boundaries, when the Global Roaming Plan is in place.

Conclusions

In a world which desires to communicate anywhere, at anytime, you are "always on", without a connection delay. It is a world where easy and effortless communications, based on mobility and personalized services, enhances quality-of-life and productivity through freedom of choice. This emerging vision of a communicating world however implies a global approach to the utilization and planning of spectrum for IMT-2000.

Specifically, planning is required to make available spectrum consistent with the GRP, considering technology limitations and market and regulatory developments. Such planning includes the development of a long-term vision to identify future spectrum needs for IMT.

When considering spectrum for IMT, a phased approach as presented in the GRP should be developed to facilitate the progression from the existing "situation" and include the consideration of existing and planned systems and their possible evolution to IMT. In addition, recognizing that some administrations will not be in a position to make available all or some of the identified frequency bands consistent with the GRP, they should not be a deterrent in the establishment of a regulatory framework which provides clarity to the industry and embraces a technology neutral approach.